A second telegram from the same source states that the comet was observed at Hamburg by Herr Graff on August 23, its position at 13h. 11·3m. (Hamburg M.T.) being R.A.=22h. 48m. 53·5s., dec.=+10° 21′ 7″.

From this it is seen that the comet is apparently in the constellation Pegasus, a little to the north of $\sigma$ Pegasi, and is moving in a south-westerly direction. This position crosses our meridian at about 12 o'clock midnight.

FINLAY'S COMET (1906*d*).—This comet will arrive at its perihelion, according to M. Schulhof's elements, on September 7·5.

As shown by the following extract from the ephemeris published in No. 4109 of the *Astronomische Nachrichten*, the comet is now apparently travelling through the extreme north-eastern corner of Orion towards Gemini, which it will enter on September 9. On September 7 it will pass about 1° south of 71 Orionis, and on September 13 about 2° 36′ north of $\gamma$ Geminorum. On the latter date the comet will rise about five hours before sunrise, *i.e.* about 12·30 a.m.

*Ephemeris 12h. (Paris M.T.).*

| 1906 | $\alpha$ (app.) h. m. | $\delta$ (app.) ° ′ | 1906 | $\alpha$ (app.) h. m. | $\delta$ (app.) ° ′ |
|---|---|---|---|---|---|
| Sept. 1 | 5 40 | +16 37 | Sept. 9 | 6 17 | +18 27 |
| 3 | 5 50 | +17 9 | 11 | 6 25 | +18 47 |
| 5 | 5 59 | +17 39 | 13 | 6 33 | +19 4 |
| 7 | 6 8 | +18 4 | 15 | 6 40 | +19 19 |

GREENWICH SUN-SPOT NUMBERS.—An innovation which is likely to be found a great convenience by everyone who has to discuss sun-spot observations appears in the August number of the *Observatory*.

Up to the present such workers have had to wait until about the middle of the next year before the serial numbers allotted to the sun-spots of any one year by the Greenwich authorities became available for general use. Now, with the sanction of the Astronomer Royal, Mr. Maunder proposes to publish these numbers month by month.

The first instalment, giving the numbers for the quarter January–March, 1906, appears in the current *Observatory*. Next month's issue will contain the data for the second quarter, and after that each month will be given separately, so that the numbers for July will appear in October, and so on.

Other data, *e.g.* the duration and the latitude and longitude of each spot-group, are also given, but, as they are determined from simply a preliminary examination, these are not to be accepted as final values.

THE ORIGIN OF THE ZODIACAL LIGHT.—Some interesting observational results, and deductions therefrom regarding the origin of the zodiacal light, appear in a brochure written by Mr. Maxwell Hall, of Montego Bay, Jamaica, and issued as a reprint from the *Monthly Weather Review* for March, 1906.

Mr. Hall's observations were made at Jamaica in 1899 and 1901, and determined the breadth of the light and its boundaries at different distances from the sun. On reducing the observed latitudes according to their longitudes, or distances from the first point of Aries, Mr. Hall obtained striking evidence which tends to show that the light is parallel to the invariable plane of the solar system, evidence which was apparently confirmed by the results obtained by other observers.

On these grounds Mr. Hall arrives at the conclusion that the zodiacal light is caused by the reflection of sunlight from masses of meteoric matter still contained in the invariable plane, which may be considered as the original plane, of the solar system.

If this conclusion is correct, and the phenomenon is astronomical in its origin, the light should be seen better and more frequently from observing stations situated in high altitudes, and the editor of the Review especially commends its observation to workers located at such stations.

A MODIFIED FORM OF SOLAR EYE-PIECE.—From Prof. Ceraski, of Moscow, we have received a brief description of a solar eye-piece which he is using, and has found to be most effective, for the detailed study of sun-spots. This eye-piece is analogous to one described by Dawes in vol. xxi. of the Memoirs of the Royal Astronomical Society, but as no one seems to have used this for the study of minute details in sun-spots, Prof. Ceraski describes the one he is now using.

The apparatus is furnished with a positive eye-piece and a copper plate pierced with circular apertures of various diameters, thus forming an adjustable diaphragm. This copper plate is protected by a disc of asbestos which contains a central aperture slightly larger than the largest in the diaphragm. The dark glass is a combination of black mica and blue glass.

Using this eye-piece with the full aperture of the Pulkowa 15-inch refractor, Prof. Ceraski was surprised at the amount of detail seen.

## *PHYSICS AT THE BRITISH ASSOCIATION.*

THE proceedings of the Mathematical and Physical Section (A) commenced on Thursday, August 2, with the delivery of the presidential address by Principal E. H. Griffiths, F.R.S. This address has already appeared in full in these columns (August 9, p. 356).

The chief interest of the meetings in this section arose in connection with several discussions which were arranged and taken up with avidity. On August 2 the Earl of Berkeley described his experiments on the measurement of osmotic pressure, both directly and indirectly from measurements of vapour pressure. The two methods give results agreeing to within 5 per cent. Mr. W. C. D. Whetham followed, and treated the same subject from the standpoint of thermodynamics and the dissociation theory, thereby stimulating Prof. Armstrong to make a vigorous attack on everything connected with thermodynamics and dissociation. In Prof. Armstrong's opinion the secret of osmotic pressure is to be sought in a thirst of complexes of water molecules. He laid stress on the importance of recent work in America, which proved that Boyle's law was satisfied for much greater strengths of solution than was shown by Lord Berkeley's results. In the course of discussion it seemed, however, that the difference was rather one of interpretation of results than of the experimental results themselves. Mr. Whetham, in his rejoinder, declared also in favour of a "thirst" hypothesis, but differed in regard to the mechanism of it.

On Friday, August 3, two important discussions took place. The former was opened by Mr. Frederick Soddy, the subject being the evolution of the elements. Mr. Soddy outlined the subject from the earliest times to the most recent developments in connection with radio-active changes. Uranium gradually changes to radium, radium to its emanation and several other successive products, until in all probability it becomes lead. Lead in turn suffers a gradual transmutation into silver. These changes proceed spontaneously, setting free energy as they occur. With regard to active attempts at transmutation in the reverse direction, which, of course, require a correspondingly large supply of energy, Mr. Soddy considers that success will be found first in a nearly complete vacuum carrying an electric discharge. Here there is very little matter carrying a large amount of energy, so that the necessary conditions would seem to be supplied. The Hon. R. J. Strutt laid stress on the fact that in radio-active changes helium was the only non-valent element produced, while in our atmosphere argon was largely preponderant. Had argon been formed by other transmutations? Dr. O. W. Richardson and Dr. H. A. Wilson discussed the apparent disappearance of matter in vacuum tubes, alluding to quantitative experiments made in the Cavendish Laboratory. Prof. Schuster emphasised the nearly complete indifference of radio-activity to temperature changes, the only temperature effect yet discovered being a small one found by Mr. W. Makower working in his laboratory. He had experiments in progress on the influence of high pressures with the aid of apparatus designed by Mr. Petavel. With this apparatus a pressure of 2000 atmospheres can be obtained; no change in radio-active charge brought about thereby had yet been detected,

but the experiments were not yet complete. Prof. S. P. Thompson, in reference to the Cavendish experiments, pointed out that it was well known that gases were *absorbed* by the walls of vacuum tubes. The Rev. A. L. Cortie, speaking from the astronomical standpoint, was able to declare that radium had not been detected in extra-terrestrial bodies, although helium, which is produced during its decomposition, is discovered in the sun. The idea of a primitive substance is very ancient; it is simply the *materia prima* of Aristotle. A considerable part of the discussion turned on the use (or misuse) of the term *atom*, a term which Prof. Tilden, speaking as a chemist, was unwilling to give up. Undoubtedly the term has lost its original etymological signification, but its use has become too fixed to expect a change to be readily made. The discussion proved so interesting and stimulating that Mr. Soddy's paper, which gave rise to it, has been directed to be published in full in the report. A more immediate consequence was that the programme for the day was completely upset; a large number of papers had to be held over in order that the next discussion arranged might be taken. The subject was the notation and use of vectors, and Prof. Olaus Henrici opened it. He explained the various notations which have been proposed for vector and scalar products, and proceeded to give examples of their use. He showed how the operator $\nabla$ might be defined without reference to analytical geometry from the relation $dU = d\rho . \Delta U$, where U = any scalar function of position, and $d\rho$ = length of displacement of the representative point. He then applied the properties of the operator $\nabla$ to the deduction, with great simplicity and elegance, of results connected with the theory of partial differential equations. Dr. C. G. Knott followed, and deplored the substitution of vectors for quaternions, and objected that neither scalar nor vector product was really a true product. He advocated a return to the methods of Sir W. Hamilton. He pointed out that Hamilton does not speak of a vector or a scalar product, but of the vector of a product and the scalar of a product. With regard to the change of the usual negative to the positive sign suggested by certain vectorists, he explained that it had compelled Gibbs to introduce a third kind of product, and more recently Jahncke had introduced a third in order to be able to treat of strains. Prof. W. M. Hicks criticised Henrici's use of brackets to denote vector and scalar products on account of liability to confusion. Prof. Henrici, in an eloquent reply, showed how easily all quaternionic results could be derived from vector analysis.

On Monday, August 6, an important discussion took place on radio-activity and the internal structure of the earth, opened by the Hon. R. J. Strutt. From the examination of a large number of rocks, both igneous and sedimentary, he had come to the conclusion that there is much more radium in all of them than would be needed to maintain the earth's internal heat if the earth were constituted of rock throughout. Hence he concludes that the interior of the globe does not contain radium, and that in all probability its composition is quite different in other respects also from that of surface materials. The thickness of the radio-active crust is estimated at forty-five miles at most, which corresponds to an estimated temperature of 1500° C. at its interior surface. The inside nucleus would be at this temperature throughout just as a loaf of bread which has been in an oven long enough takes up a steady temperature equal to that of the oven. In reply to the possible objection that a gram of radium diffused through an enormous volume of rock may not develop nearly so much heat as it would do if concentrated, it was argued (1) that the rate of emission of alpha particles of pitchblende (to which particles the heat is mainly due) is exactly what might be expected on the view that the radium atoms contained in the mineral are as energetic as they would be if they were all collected together, and (2) direct measurements made by Pegram on uranium and thorium have shown that these feebly active elements give about the amount of heat which their activity would lead one to expect. Prof. J. Milne, who followed, directed renewed attention to the bearing on the problem of the three phases of earthquake tremors. The first, for stations connected by small chords, travels at a slow, nearly constant rate, but for chords penetrating to a depth greater than twenty miles the velocity increases to about 12 kilometres per second, indicating that the wave is carried by something more rigid than the outer crust. Prof. J. W. Gregory, speaking as a representative of the Geological Section, considered that Strutt had struck a blow at the theory of contraction by cooling. We are no longer bound to believe in very high temperatures in the past history of the earth. Arrhenius's theory may now be dismissed. He suggested the importance of mapping a small area completely in regard to the radio-activity of the rocks comprised in it. Sir W. Crookes declared his belief that radium inside the earth may not be so radio-active as at the surface. Pitchblende in thick masses behaves much the same as in thin layers. An experiment in which 50 mg. of radium were sealed in a glass tube and deposited in a cavity in ice, and an exactly similar tube containing 50 mg. of silica was similarly deposited, showed that neither sank as much as one-thousandth of an inch during prolonged observation. Sir G. Darwin directed attention to the work of Gilbeck, Putnam, and Hayford, of the United States Coast Survey, who had fixed a limit of about seventy miles to the thickness of the crust. Sir Wm. Ramsay suggested that Mr. Strutt should make a special examination of sulphides with the object of finding whether they contained radium. He further queried whether alpha particles give out all their energy as heat—a query which must most probably be answered in the negative.

Mr. R. D. Oldham (also representing the Geological Section) gave distinct evidence, derived from earthquake phenomena, that there must be a central core, the radius of which is about 0·4 of the earth's radius, having rather less resistance to compression than the main body. Prof. H. Lamb threw out a warning against laying too much stress on arguments based on observation of earthquake velocities. Too little is known as to effects of pressure and temperature.

Mr. Soddy showed that another explanation of the apparent absence of radium heat might arise from processes of upbuilding going on which may depend upon a possible concentration factor. Prof. Hicks emphasised Mr. Soddy's suggestion, and pointed out that even cooling might be produced by such building-up processes. He also suggested that the reason temperature does not usually affect radio-active changes is that time comes in as a factor, and he would like to see experimentally whether a very long application of a low temperature would not produce some effect. Mr. Fearnsides indicated that in the most radio-active rocks elements of high atomic weight were associated with those of low atomic weight.

The last organised discussion was held on Tuesday, August 7, the subject being the nature of the radiation from gas mantles. Unfortunately Mr. Swinburne, who was to open it, was unavoidably absent; his paper was therefore read by the recorder. It consisted of a spirited outline of the various theories that had been proposed to account for the high luminous efficiency of the Welsbach burner, with a declaration in favour of the simple temperature explanation. Low emissivity allows the mantle to approach the temperature of the flame; a substance of greater emissivity could not rise so high in temperature, and consequently the radiation which the latter would give out would not be so rich in luminous qualities. "Though this simple explanation may be ample it does not follow that there may not be all sorts of curious things, such as selective emission, luminescence, catalytic action, resonance, unstable oxidation and other occurrences whose names are as impressive as vague." Dr. H. Rubens, of Charlottenburg, followed with an account of the experiments which he has recently conducted, and which have been described in Drude's *Annalen*. Ceria for radiations in the immediate infra-red is a very poor radiator, while for luminous and the extreme infra-red radiations it behaves much more nearly as a perfectly black body. On the whole, the thoria-ceria mantle has poor emissivity, and its temperature approaches 1600° C., while the nature of the radiations from the added ceria confers additional richness on the proportion of luminous

rays emitted. An experiment which Dr. Rubens showed to the section is of great importance in connection with the interpretation of the phenomena. Light from an electric lantern is focused upon a cold Welsbach mantle, and after reflection therefrom is re-focused upon a white screen. A blue cell is interposed to isolate the blue portion of the radiation. If now the Welsbach burner be itself lighted so as to heat the mantle, the image on the screen grows fainter; *the mantle is a poorer reflector for blue light at high than at low temperatures*, and it is therefore a better radiator when hot. Indeed, a temperature can be found at which it emits as much blue light as a perfectly black body. When the experiment is made with red light the reflected light increases with the temperature. Thus the fact that a Welsbach mantle is white when cold tells one nothing as to the character of radiation it will emit when hot. In the open discussion which followed Prof. S. P. Thompson considered that Dr. Rubens had demolished statements made by Mr. Swinburne in a previous paper. Prof. Callendar put in a word on behalf of Mr. Swinburne, whom he considered to be essentially in the right, though he had probably not laid sufficient stress upon the importance of the selective character of the radiation of ceria. Dr. Rubens expressed himself also as sharing Mr. Swinburne's views. Sir Wm. Ramsay directed attention to Urbain's recent work on phosphorescence, while the recorder of the section emphasised the distinction between the opposing schools by pointing out that, according to the "temperature" school, the radiation of the mantle is the sum of the radiations which would be given out by the thoria and ceria if separated and still at the same temperature, while according to the "chemical" school there is present an additional radiation arising from interaction between the constituents of the mantle. Dr. Rubens did not seem willing to admit that the radiation is wholly of this additive type, although it is so in the main. The discussion was enlivened by the president reading replies which Mr. Swinburne had sent ready for use against those with whom he had previously engaged in controversy.

We will now turn to the papers in connection with which no discussion had been organised.

Mr. W. G. Duffield read a paper on photographs of the arc spectrum of iron under high pressures. The apparatus by which the pressures were obtained was designed with the help of Mr. Petavel. The photographs which were shown demonstrated clearly that several lines not merely widen out, but undergo an actual shift towards the red.

Major E. H. Hills and Prof. J. Larmor communicated a paper on the irregular motions of the earth's pole, being a preliminary graphical analysis of their causes. In the ensuing discussion Mr. R. D. Oldham asserted that the amount of matter transferred in a recent Indian earthquake was at least 10,000 times that assumed by the authors. Prof. Schuster was inclined to question the accuracy of the observations themselves owing to their minuteness; the whole shift of axis under discussion amounts only to about 20 feet. Besides, the yielding of the earth owing to the shift of its axis might be the determining cause producing the earthquake, and not *vice versâ*.

Prof. H. H. Turner read a note on a possible effect of vibration on zenith distance observations, with special reference to the tremors which threaten the Royal Observatory at Greenwich. The special effect referred to is similar to one observed long ago in Ireland due to the Ulster railway. If the telescope is set and a train passes the adjustment is found afterwards to be upset. The tremor of the passing train causes a release of any existing strain. Even if at each passage the release of strain may not produce a visible effect, yet the continued action of tremors will be to produce a gradual settling down of the instrument at a different rate from that at which it would proceed if tremors were absent. In the discussion the Astronomer Royal for Scotland declared that in his observatory they were probably free from any tremors, except those caused by their own lathes. The following papers on cosmical physics were also read:—the Astronomer Royal for Scotland, spectroscopic observations of solar eclipses; Prof. Schuster and Prof. H. H. Turner, a note on rainfall; the Rev. A. L. Cortie, the connection between disturbed areas of the solar surface and the solar corona; Miss C. O. Stevens, telescopic observations of meteorological phenomena; the Right Hon. the Earl of Rosse, the measurement of lunar radiation; Mr. J. E. Clark, the York rainfall and sun-spots; and Dr. W. J. S. Lockyer, some barometric and rainfall changes of an oscillatory nature.

In the department of general physics, Mr. C. E. S. Phillips described a glass of low electrical resistivity consisting of thirty-two parts of sodium silicate to eight parts calcined borax, to which 1·25 parts Powell's flint glass is added in order to increase the stability. This glass is intended to be used for the windows of electrostatic instruments which require to be electrically shielded. Its electrical conductivity is about 500 times that of the most conducting glass hitherto made. When powdered and fused on to clean copper, it adheres well without cracking. The change of resistivity with heat is being examined. In the discussion Mr. Rosenhain mentioned that glasses of the general composition of this one were not unknown in the trade. Dr. Erich Ladenburg gave an account of his researches on nearly pure gaseous ozone. This has a dark blue colour in a thickness of 30 cm. In the absorption spectrum were discovered five new bands which do not belong to ozone, but which always appear when the liquid ozone is allowed to vaporise. The gas to which they belong can be separated from ozone. The change of volume which occurs when the new gas is transformed and the value of the density indicate that the new gas is a more complex form of oxygen. In the discussion Dr. Rubens, in whose laboratory the research had been conducted, expressed his belief that it consists of hexatomic oxygen. Mr. Herbert Stansfield showed a series of photographs of thin liquid films in which the two kinds of grey and the three kinds of black are sharply distinguishable from one another. A paper by the Rev. B. J. Whiteside was communicated and read by Prof. F. T. Trouton, the subject being the rate of decay of the phosphorescence of Balmain's paint. The photometer employed depended upon the inverse square law. The standard light which was emitted through a small hole could be moved to various distances from an opalescent screen placed adjacent to the surface of luminous paint in a box. The distance was adjusted so as to maintain the intensity of the two illuminations the same, and the times corresponding to equal shifts of the standard were recorded on a revolving drum. The law of variation of intensity was found to be capable of representation by the formula $I=1/(a+bt)$, where $t$ is the time reckoned from that at which the paint ceased to be exposed to the exciting light. This result is of great interest, inasmuch as the same law arises in connection with the recovery of overstressed bodies, and this correspondence suggests that the mechanism involved may be similar in the two cases.

Sir Wm. Ramsay and Dr. J. F. Spencer described experiments on the chemical and electrical changes induced by ultra-violet light. These were in some cases confirmatory of what had previously been done in connection with this interesting subject. The result of greatest novelty and importance is that the fatigue of the surfaces was found to vary in a peculiar way. The rate of falling off when plotted against the time yields a curve presenting obvious breaks. In the case of dyad metals there are two of these breaks, and two places of constant rate of tiring; for tetrad metals four of these stages are observed. The paper was read by Dr. Spencer, and Sir Wm. Ramsay followed with an extended statement showing how the electronic theory of matter accounts for the photoelectric effects observed. Dr. O. W. Richardson mentioned that Dr. Smolochowski in some unpublished experiments had succeeded in showing that in a high vacuum the decay phenomena cease to take place.

An important paper was contributed by Mr. F. Soddy on the positive charge carried by the alpha particle of radium C. The substance of this paper has already appeared in the form of a letter in NATURE for August 2. Is or is not the alpha particle charged when it commences its separate existence? Mr. Soddy thinks he has proved that it is not so charged, and, assuming the validity of this conclusion, he considers that possibly too much stress

has been laid on the importance of electricity in connection with radio-active changes. Papers by Prof. E. H. Barton and J. Penzer and by Prof. W. F. Barrett were taken as read in the absence of the authors.

In the department of mathematics, Prof. A. C. Dixon read a paper on expansions in products of oscillatory functions, being an extension of a paper published recently by the author in the Proceedings of the London Mathematical Society. It deals with the expansion of a function of two variables $f(x, y)$ in the form $\Sigma\Sigma\phi_m(x)\psi_n(y)$, where $\phi$ and $\psi$ are functions of given type. Prof. W. H. H. Hudson described an analytical investigation of the curves traversed by a particle in a cyclonic storm. The curves appear to agree fairly well with observation, thus justifying the assumptions on which they are calculated. Lieut.-Colonel A. Cunningham gave some new properties of certain high powers of 2 called hyper-even numbers. Prof. A. R. Forsyth gave an interesting account of a revised theory of the solution of Lagrange's linear equation $Pp+Qq=R$. He showed that the solution hitherto accepted as the most general, viz. $\psi=f(u, v)$, where $u=a$, $v=b$ are any two independent integrals of the equations $dx/P=dy/Q=dz/R$, is not in reality the most general, and that other solutions exist which cannot be put in the usual form. Major P. A. MacMahon read a paper on two new symmetric functions which showed certain very interesting reciprocal relations between two sets of algebraic quantities. Papers by Mr. H. Hilton, on finite groups; by Prof. T. J. I'A. Bromwich, on multiple series, giving a new test for the convergence of a double series of positive terms; by Mr. A. R. Richardson, on many-valued functions of real variables; and by Prof. Alfred Lodge, on a new method of computing Bessel functions for high values of the argument, were read by Dr. L. N. G. Filon in the absence of the authors. The last paper was the means of the creation of a new committee with a small grant for the purpose of the further tabulation of Bessel functions.

Besides these papers there were the usual reports of committees, which contain much interesting matter. This is especially the case with the seismological report. Unfortunately the programme of the section was so full that the reading of these and of other papers had to be cut down. In order to indicate how full the programme was, it may be mentioned that on the Tuesday morning meeting the section met in three departments simultaneously, as well as at the same time sending representatives to two other sections where joint discussions were being held. In spite of this segregation the separate departments were very well attended. Altogether great interest was taken by the committee and members of the association in making the meetings a success. A. W. P.

## *ANTHROPOLOGY AT THE BRITISH ASSOCIATION.*

THE Anthropological Section met this year in the Victoria Hall, York, under the presidency of Mr. E. Sidney Hartland.

The president delivered his address on Thursday morning, August 2, taking for his subject recent research in the origin of magic and religion. After tracing the universal belief held by savage peoples that objects, animate or inanimate, are endued with a life and personality which is not confined to any particular object, but to all alike, Mr. Hartland showed how this personality was not only endowed with qualities, but by virtue of these very qualities possessed a potentiality and atmosphere of its own. This potentiality is known among some tribes by the name *orenda*, among others by the name *mana*, but by whatever name it is called the idea is substantially the same. In this *orenda* is found the root of all magic and religion. "Magic is primarily an application of *orenda*. By his *orenda* a man bewitches his enemy . . . causes rain or sunshine . . . divines the cause of sickness and cures it, raises the dead, spells out the future." His incantations and spells would be useless without this. Similarly, prayer is an application of *orenda*; in fact, this belief in a man's supernatural power and the efficacy by which the supernatural can be used to benefit man is the foundation of religion. The medicine man, shaman, or priest is merely the possessor of a more powerful *orenda* than his neighbour. It might be objected that this theory was upset by the Australians, and especially the Arunta, who are supposed to be in a state of primitive atheism; but not one of the Australian tribes is, strictly speaking, primitive, and in none of them is the idea of religion entirely absent, and what ideas they have are not at variance with, but complementary to, the theory here suggested.

The remainder of the morning was taken up with papers on general ethnology.

Messrs. T. A. Joyce and E. Torday communicated a paper, notes on the ethnography of the Ba-Yaka. These people, who live between the Inzia and Kwango rivers, tributaries of the Kasai, in the Congo State, have not previously been described, and the paper was consequently of unusual interest and value. Their culture, which is distinctly allied to the primitive West African type, proves them to be closely connected with the tribes on their southern and western borders. The men are small but well built. They do not practise cannibalism, but eat practically every other kind of flesh. They are skilled in handicrafts, but they have never heard of stone implements. The tribe is ruled by one paramount chief, but each village is immediately governed by a petty chief. The dead are buried in a sitting position, and the people believe that the soul leaves the body at death and visits the living in dreams. In the case of important persons it is thought that the soul is transferred to the body of a large animal.

Mr. F. W. Knocker read a paper on the aborigines of Sungei Ujong, who inhabit the hills to the north and north-west of Negri Sembilan, in the Malay States. The people are short but well built, with thick black hair and dark brown eyes. They have no birth, marriage, or death ceremonies, no religion or belief in an existence after death, nor do they practise any form of magic or witchcraft. Their chief weapon is the blow-pipe, with poisoned darts.

In a short discussion several speakers expressed themselves as very sceptical as to the absence of religious beliefs among the people, and Mr. Knocker, while stating that he had made every possible inquiry, admitted that the natives were extremely reticent when questioned on such matters.

Mr. S. S. Buckman communicated a paper on marriage and mating, in which he contested the views of Mr. Lang and Dr. Westermarck; and the morning's work was concluded by a paper on the Bushmen of Basutoland, by Mr. S. S. Dornan, in which he had collected all that is at present known about these interesting people.

In the afternoon the report of the committee appointed to explore the lake village at Glastonbury was taken. The work on this site is now nearing its completion, and in the past season a large area situated in the north-west corner of the village was explored. During the exploration another dwelling site, hitherto unrecognised, was brought to light, bringing the total number up to eighty-three. The finds were well up to the average of former years.

Dr. A. C. Haddon then gave an illustrated lecture on the ethnology of South Africa, in which he dealt chiefly with the manners and customs of the tribes whom he came across during the visit of the association to South Africa last year.

On Friday, August 3, the papers were generally of an archæological character.

Major P. Molesworth Sykes exhibited a collection of bronze weapons and implements found near Khinaman, in south-east Persia. The find consisted of five bowls, two pins, two knives, two javelin heads, two armlets of ordinary penannular form, two axe-heads, two rods with curved ends, and some clay vessels.

Notes on the collection were communicated by Canon Greenwell. The objects are undoubtedly grave goods, and are of the utmost interest on account of the light they throw upon the early metallic culture of the country. The bowls are of hammered copper, and one of them is provided with a handle or spout. It is difficult to say what the rods represent, but they may be symbols of authority. The axes are the most important part of the find. They were not weapons, as the method of fastening the handles precluded them being used for cutting. They